DATAFLYER

USER MANUAL

EXPANSION
SYSTEMS

TABLE OF CONTENTS

Congratulations on your purchase of the DataFlyer hard drive controller. The DataFlyer offers great performance at a cost attractive to the price conscious customer. The DataFlyer provides the user the option of upgrading to other types of drives if the need arises. If you need more memory the DataFlyer can accept the DataFlyer RAM card that provides up to 8 megabytes using easy to install SIMM memory modules.

This manual covers all controller configurations of the DataFlyer. Information is provided if you have the SCSI or the IDE or the special combination controller that can operate both types of drives at the same time. Whatever DataFlyer you have chosen to add to your Amiga it will greatly enhance the storage capacity and overall system performance. With these new capabilities we wish you great computing.

User Engineering

The DataFlyer was also designed to be simple and easy to use. Expansion Systems promotes a concept we like to call User Engineering. It is a design approach that utilizes the high technology in technical products and makes them easier to use. We try to design into our products features that allow the user to take advantage of very advanced technology without having to be technologically advanced.

Easy to use software. As an example, the AutoInstall program used to format the drive is part of this effort. This program makes formatting a drive as easy and as automatic as possible. It presents an Automatic Install function for the first time user. One click of a button and the drive is completely formatted automatically. This is very important for the first time user who just wants to benefit from the product and not become a computer expert. If you are a more experienced user, then you are presented with the formatting options one at a time and in the proper order. Every option is provided to completely customize the system of the most demanding user.

Complete "on line" help information. There is another important example of User Engineering and making technology contribute to the simplification of computer products. The DataFlyer AutoInstall disk can be used without ever having to read the manual. This is because it contains, within the program, the actual user manual. This manual is stored in over 30 on-line help files easily accessed by clicking the "Help" button located on the screen. Contained within these files is all the information, written in easy to understand language, that is really required to install and format your drive. The benefits of having the manual provided in the software are many, including: 1) The manual cannot be misplaced, 2) Information can be quickly received at the click of a button, 3) The manual information can be quickly revised and provided to the user.

Quality Story

One of the areas in which Expansion Systems excels is in quality control. 100% of all DataFlyer units leaving the factory has been tested. The controller section is booted

and tested with a hard drive attached and a real person performs a series of tests. The DataFlyer RAM optional memory card has a full 8Mb of memory installed and the board must pass a test that cycles through a specific number of memory reads and writes. The memory is then removed by hand and packaged for shipment. Yes, this is time consuming but it pays off in customer loyalty and the comments on our warranty cards is worth it all. If there are returns and repairs, we strive to get them back out and on the road to you as quickly as possible. Often within 48 hours of receiving your package. Look for Expansion Systems to continue to provide great products at great prices for the Amiga computers.

PLEASE READ THIS

THE FIRST TIME YOU FORMAT YOUR DRIVE
THERE WILL BE A ONE TIME 60 SECOND DELAY
WHEN POWERING UP THE COMPUTER.

Quick Format Instructions

Some people have installed this type of hardware and want to skip all the reading. If you have installed the DataFlyer into the A2000 or onto the A500 and are ready to format the DataFlyer, please go through the following checklist:

1. If you are running Kickstart 1.2, you ***MUST*** make a copy of the DataFlyer Auto-Install disk. If Workbench is used to copy the disk, be sure to remove the "copy of" from the disk name. Be sure to get the space after the word "of".
2. Boot the Amiga with the Install disk (or a copy of it) in DF0:. WAIT FOR THE 60 SECOND DELAY after turning on the power if the drive has not yet been formatted.
3. Double-click the DF-PREP icon to begin installation.
4. Follow through the installation procedure as outlined in this manual. Use the "HELP" buttons in the software if necessary.
5. Remove the Install disk from DF0: and reboot the computer.

Your DataFlyer will have autobooted and you are ready to install your programs.

Reformat Instructions

If you are reformatting your drive then you will need to keep the drive from autobooting. This is done by **holding down the left mouse button when power is turned on** and following the instructions above. Hold the left mouse button down until the AutoInstall disk in df0: starts to load. Then it can be released.

TO REFORMAT A FORMATTED DRIVE
HOLD DOWN THE LEFT MOUSE BUTTON
AND TURN ON THE POWER TO THE COMPUTER.

Booting the Software
If you are new to the Amiga's operating system and require some assistance in booting the Install software, please follow these simple booting instructions:

1. With the computer powered off, insert a copy of the DataFlyer AutoInstall diskette into the internal floppy drive (DF0:).
2. Power on the computer. If the hard drive has not yet been formatted, **there will be a 60 second delay** as the DataFlyer searches for information on the hard drive. This delay will only happen once, and will stop after the drive has been formatted.
3. After the floppy disk has been completely booted, the Workbench screen will appear. Using the mouse, double-click on the "AutoInstall" disk icon, which is usually located on the bottom-left corner of the screen. This will open a window showing the contents of the Install diskette.
4. Locate the icon labeled "DF-Prep" and double-click it to begin the software installation.
5. If this is your first hard drive and want to keep things simple, we highly recommend using the Automatic installation procedure. Once you become more accustomed to working with the hard drive, you can always go back into the Prep software and customize the drive to better suit your needs.

INSTALLING THE HARDWARE

Configuring the DataFlyer Controller Card
There are 4 jumpers that are used to configure the DataFlyer. The descriptions and their settings are shown below:

Autoboot If you are using KickStart 1.2 this jumper should not be installed (OFF) on the two pins. The drive will not autoboot using KS 1.2 and must be booted via a boot disk created by the installation program. If you are using KickStart 1.3 or higher the jumper should be installed (ON) on the two pins.

+5 Enable When this jumper is installed the DataFlyer receives its power from the A500 expansion bus. Even with the power supply attached this jumper MUST stay on!

C= Config jumper. This shorts the config in and config out (pins 11 and 12) on the 86 pin bus. The shorting of these pins passes the configuration signal to the next slot. This jumper is to remain in place unless there is a memory board installed.

S = Slave jumper. This is always installed if the DataFlyer does not have a memory card attached to the memory header.

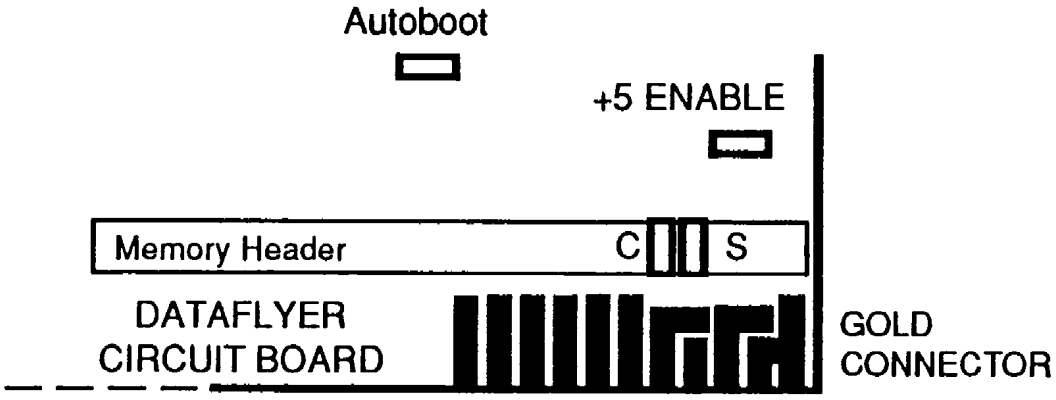


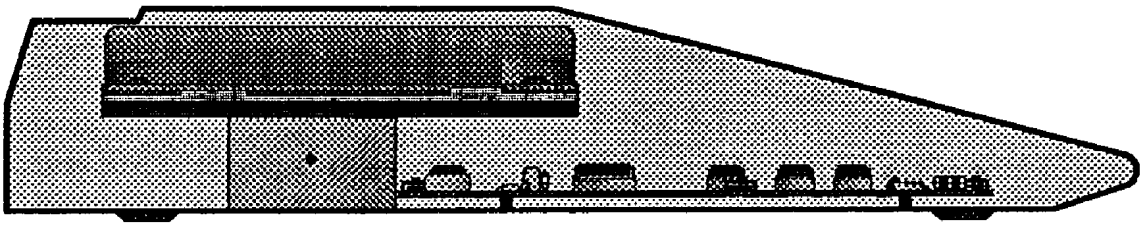
Diagram A
Configuration Jumper Positions

SCSI AND IDE CONSIDERATIONS
There are very few installation differences between the SCSI and the IDE controllers. Installation is the same with the exception of the location of the ribbon cable connectors and their size. The SCSI cable is 50 pins while the IDE (or AT) cable is 40 pins. See Diagram C and D for the location of the two connectors. SCSI & IDE combination card users will be using or can use both.

ASSEMBLING THE DATAFLYER
To assemble the DataFlyer hard drive and attach it to your A500 follow these steps and refer to Diagram C and D.

1. Remove the metal cover from the DataFlyer by removing the 4 screws located at the front and rear of the chassis.

2. Inside you will see the PC board with the 86 pin connector to the Amiga and the 2 headers for the hard drive cables. The cable for your drive should already be attached to the header. If not, locate the header for your drive and attach the ribbon cable making sure that the cable is oriented properly. The SCSI is labeled "SCSI Connector" on the face of the controller card. The IDE is labeled "IDE Connector". See Diagram B. The key on the cable should match the Diagram. The red lead on the cable should also be on the same side that says pin 1 and 2 also noted on the board. THIS CABLE MUST BE INSTALLED PROPERLY. Also this cable must be installed on the SCSI connector due to room before mounting the drive.



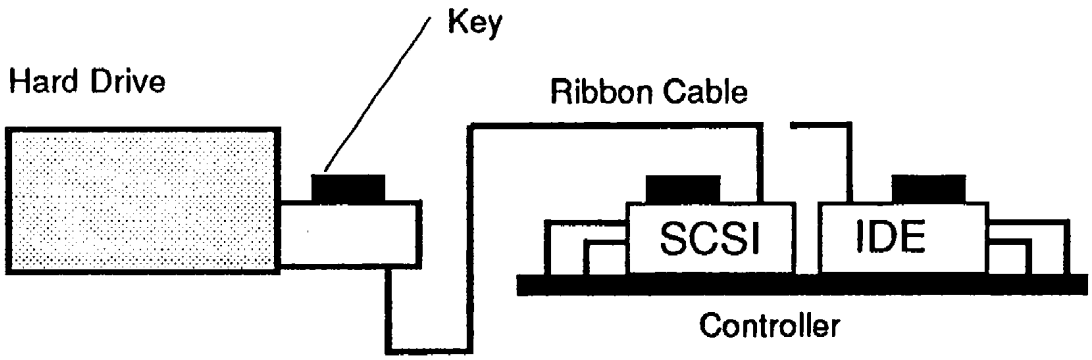


Diagram B

DataFlyer 500 Cable Configurations

> Warning. The 40/50 pin ribbon cable must be installed correctly or you may damage your hard drive or controller.

3. Next find the Hard Drive mounting bracket. Orient the drive with the connector end toward the controller card. Mount the drive to the bracket using the 4 screws and 4 plastic washers supplied. DO NOT OVER TIGHTEN the drive mounting screws. The standoffs must be used to prevent the screws from traveling too far into the drive. After the drive is mounted attach the bracket into the chassis using the 3 screws supplied. A slight outward push on the upward sides of the chassis will help remove or install the bracket.

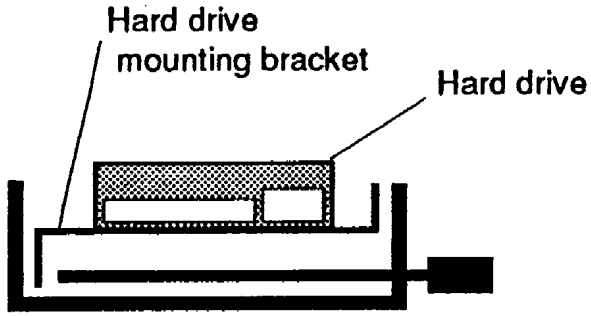


Diagram C

DataFlyer chassis front end view.

4. Next attach the power cable to the drive. This cable is attached to the interface and terminates in a 4 position white (female) connector. This connector which has three wires should be placed into the 4 position (male) connector on the hard drive. You will notice that both ends of the connectors are shaped like a "D". This is to prohibit plugging it in backward. Be sure the connector is pushed in as far as it will go. See Diagram D.

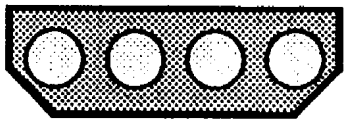


Diagram D

Hard drive power connector
end view.

5. Now replace the cover that was removed using the 4 screws.

6. Remove the plastic expansion bus cover from the A500. It is found on the left hand side of the computer. It snaps in place. Behind it is the 86 pin Amiga expansion bus that the DataFlyer must plug onto. This gives it access to the computer and its operating system.

7. Align the 86 pin (female card edge) connector with the Amiga (card edge) expansion bus. When you are sure they are aligned properly press the DataFlyer chassis firmly onto the bus. The DataFlyer chassis should be touching or very close to the case of the Amiga when installed. See Diagram E.

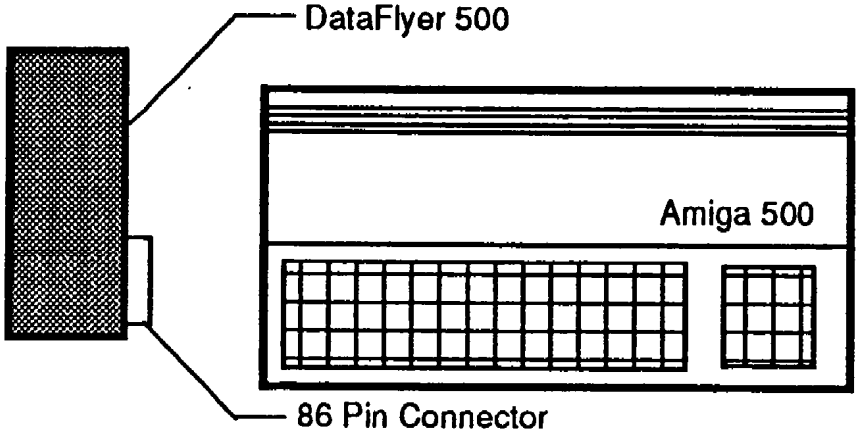


Diagram E

A2000 DataFlyer
To install the DataFlyer hard drive into your A2000 computer follow these steps:

Configuring the DataFlyer
To configure the DataFlyer to your system see the section Configuring the DataFlyer and Diagram A on pages 4 and 5 of this manual.

Installed as a hard card.
1. Attach the 3.5 inch hard drive to the interface by using the 4 standoffs and screws provided. Place the standoffs between the drive and the interface. Check that the screw is not too long and touches the circuit board of your drive. Be sure the drives 50 pin SCSI connector is toward the 50 pin header on the DataFlyer. See Diagram F.

2. Remove the 50/40 pin SCSI/IDE flat ribbon cable. This cable connects the drive to the DataFlyer interface. One side is attached to the connector on the hard drive and the other is attached to the header on the DataFlyer interface. This cable must connect pin 1 of the interface to pin 1 of the drive. One way to check is to locate the header on the interface. It will have pin 1 and 2 indicated on the surface of the board. The red lead on the cable (see Diagram C) indicates pin one of the cable and they should be on the same side. This is regardless of whether the cable has strain relief or not. It must be installed correctly or damage may result.

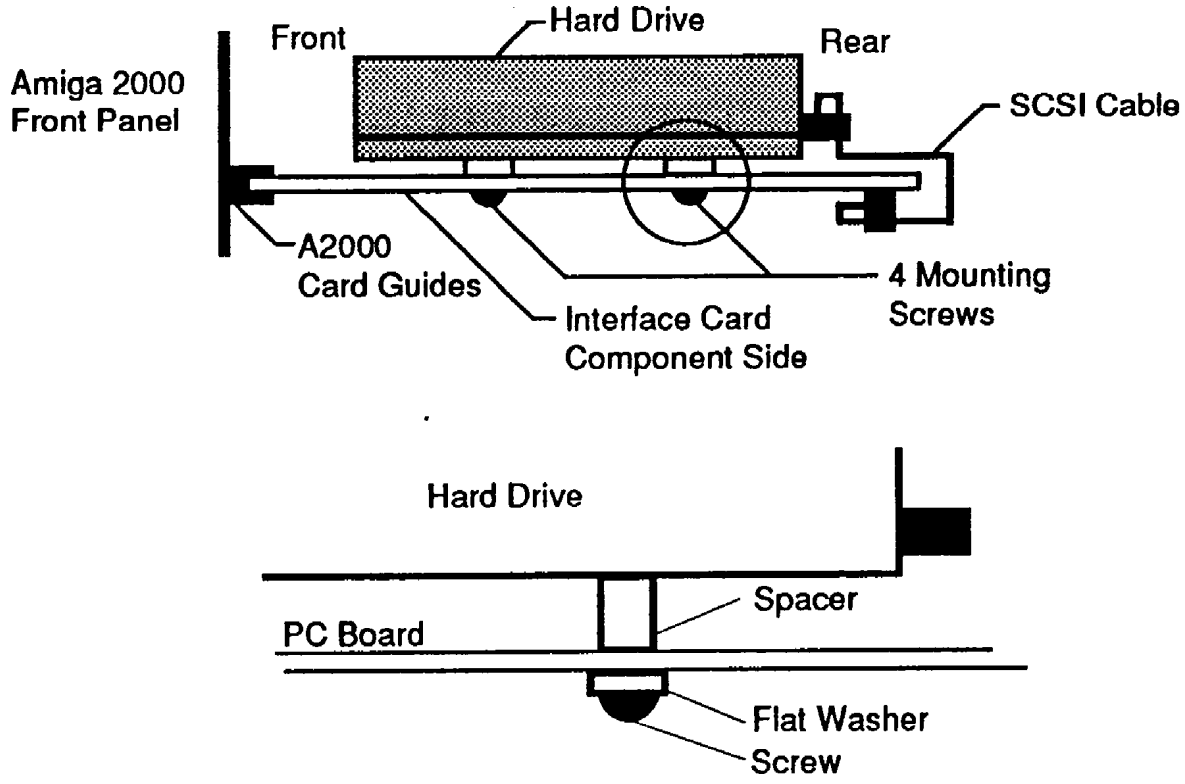


Diagram F
Mounting Hard Drive Onto Interface

Warning. The 50 pin 4 inch ribbon cable must be installed correctly or you may damage your hard drive or interface.

3. Next attach the power cable to the drive. This cable is attached to the interface and terminates in a 4 position white (female) connector. This connector which has three wires should be placed into the 4 position (male) connector on the hard drive. You will notice that both ends of the connectors are shaped like a "D". This is to prohibit plugging it in backward. Be sure the connector is pushed in as far as it will go. See Diagram D.

Installed in the drive bay.
The 3.5 inch hard drive can also be installed in the empty drive bay. If this is desired you must obtain a longer drive cable. This cable is standard and most dealers (both IBM and Amiga) should have them. If you have chosen to mount your DataFlyer into the drive bay use the Amiga's 4 pin power connector (not the DataFlyer's) and attach it to the power connector of the hard drive as described previously.

Note: The DataFlyer has several component positions that are designated and not filled or installed. There are two versions of the DataFlyer interface that share the same printed circuit board. This saves you money and allows you the opportunity to upgrade to a card that has both IDE and SCSI. Also, if your DataFlyer card was installed in the A2000 and shipped to you it may have a foam piece installed on the top of the card. This is used to prevent your card from working out of the slot during transit.

Installing the Interface.

1. Remove the 5 screws that hold the cover in place and lift it off.

2. Looking down over the computer you can see the Amiga and IBM expansion slots. The DataFlyer interface will be placed into one of the empty Amiga slots. If you have configured your drive as a hard card with the drive on the rear of the card place the DataFlyer unit into the last slot. If you are using the optional rail kit place it in the first slot. This keeps the width of the drive from using two slots. If all the slots are empty and this is not an issue then it may be placed in any slot. If you placed the hard drive in the bay then the interface can be placed in any slot. Check the manuals of your other cards to determine if there is a preferred slot or order.

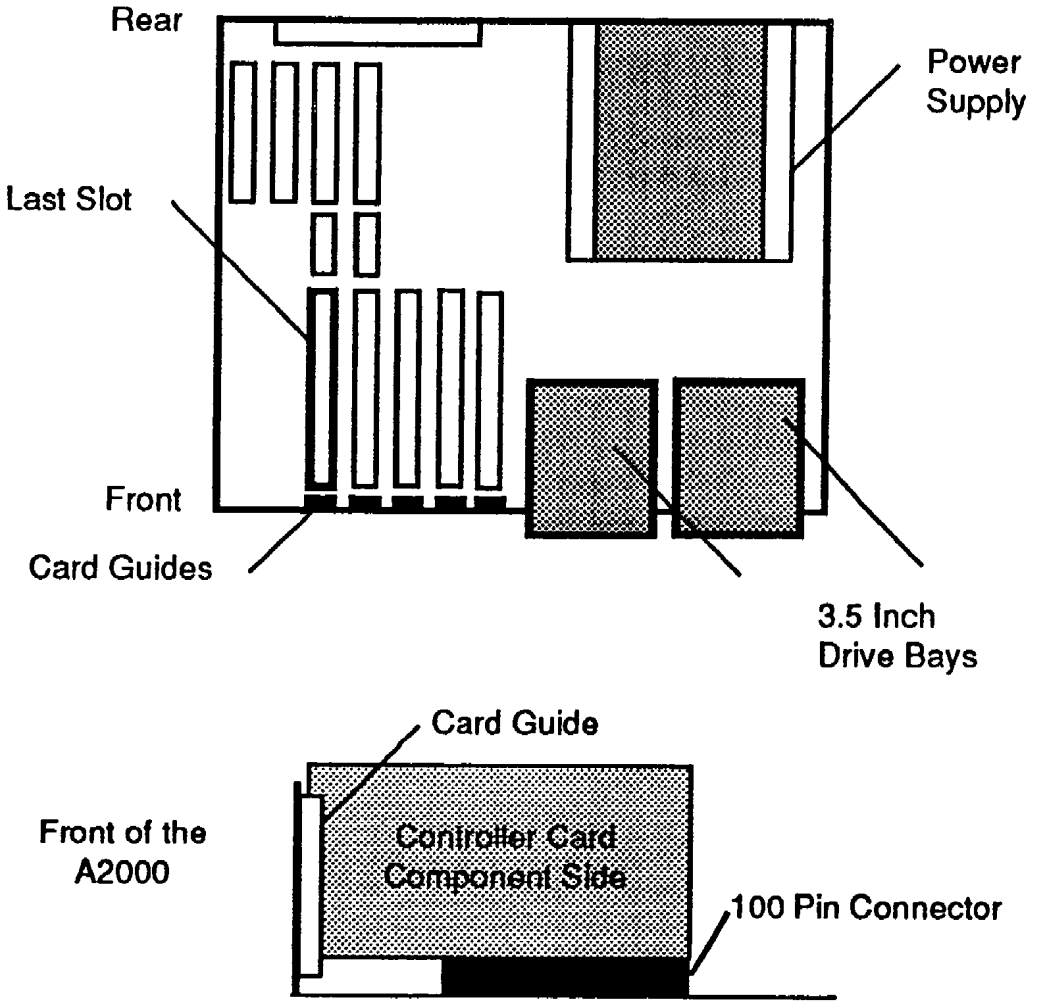


Diagram G

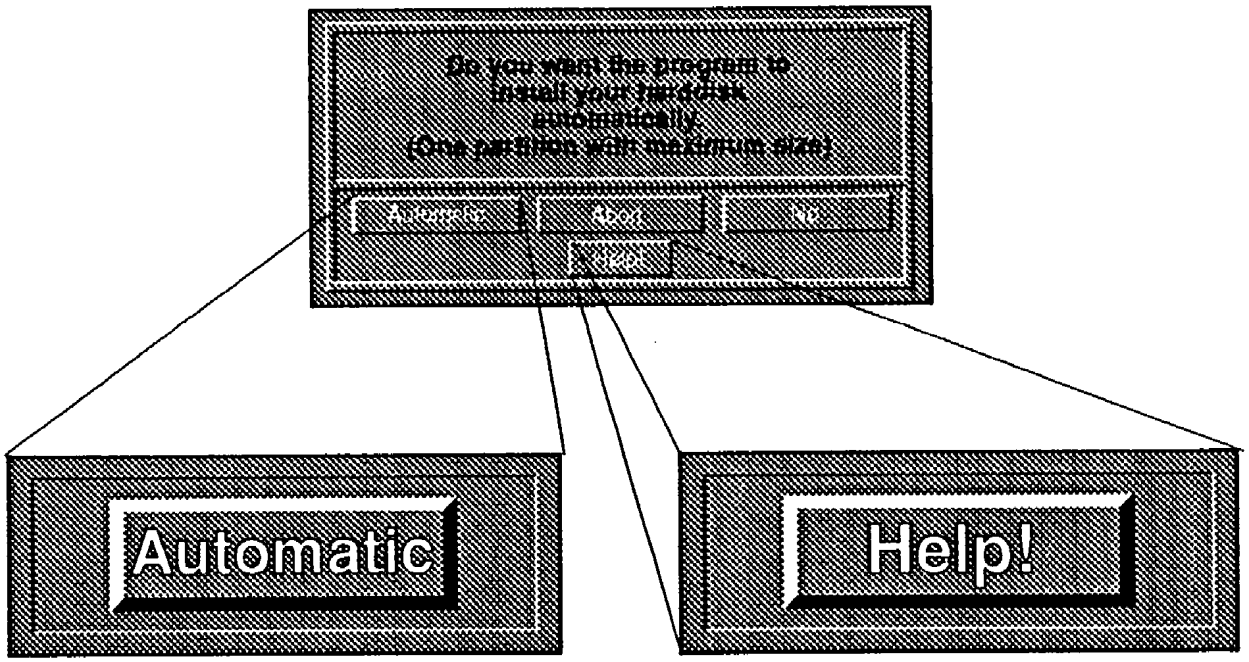
Amiga 2000 Top View

3. Orient the interface with the front (IDE half) of the interface sliding into the plastic card guide in the front of the A2000 and the gold card edge connector of the interface into the expansion slot. The component side of the board should be facing the power supply of the computer. When you are sure of the alignment press down firmly onto the top of the card. The interface card should be seated completely into the slot.

4. Attach the LED connector from the Amiga to the LED 6 pin header on the top left hand corner of the interface. The connector from the Amiga has a 3 pin connector with 2 wires. Be sure that the 2 pins from the header are connected to the 2 positions that have wires. Connect it to either the SCSI or IDE location. When your drive is booting look for the LED light to flash on and off. If the light does not flash then you must reverse the polarity of the pins. This is done by disconnecting the 2 pin header and reversing the connections.

About the Software

One of the major features of the DataFlyer is its easy formatting or installation software. There was a time when formatting a drive it was a formidable and complicated task . It was a major effort to learn a whole new set of phrases and functions when what you really wanted was a large fast floppy...and you want it now. This new special software from Expansion Systems makes formatting the drive as simple and automatic or as comprehensive and detailed as your needs dictate. This is due to two very special features of the AutoInstall program which are the Automatic install and the HELP buttons.



Automatic Install

This feature lets the first time user format the drive using preset values and one partition. It is completely automatic and when it is done your drive is ready to use. It is recommended for first time users until you develop a sense of your specific needs and how the drive should be customized.

HELP Button

Chances are the drive can be formatted without reading further than this section of the manual. The actual manual covering formatting the drive is contained in the software's "HELP" files. These help files are accessible by clicking the "HELP" button then clicking the file in question. The "HELP" buttons are found on every screen. This will give you all the information that is required to easily install and format your drive.

If you want a step by step description of the AutoInstall program please refer to the following section starting with the actual booting of the AutoInstall disk. With the on-line HELP information and referring to the following steps it should be easy going. If you have any problems call your dealer or Expansion Systems customer support line at 510 656-2890 from 8:00 AM to 11:30 AM and 12:30 PM to 5:00 PM Pacific Standard time.

Booting the Software

Please follow these simple booting instructions:

The first time you format your drive there will be a one time 60 second delay when powering up the computer.

1. With the computer powered off, insert a copy of the DataFlyer AutoInstall diskette into the internal floppy drive (DF0:).
2. Power on the computer. If the hard drive has not yet been formatted, **there will be a 60 second delay** as the DataFlyer searches for information on the hard drive. This delay will only happen once, and will stop after the drive has been formatted.
3. After the floppy disk has been completely booted, the Workbench screen will appear. Using the mouse, double-click on the "AutoInstall" disk icon, which is usually located on the bottom-left corner of the screen. This will open a window showing the contents of the Install diskette.
4. Locate the icon labeled "DF-Prep" and double-click it to begin the software installation.

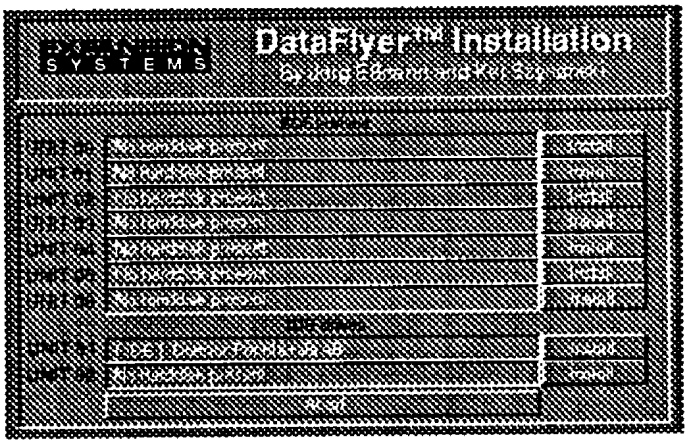
5. If this is your first hard drive and want to keep things simple, we highly recommend using the Automatic installation procedure. Once you become more accustomed to working with the hard drive, you can always go back into the Prep software and customize the drive to better suit your needs.

Formatting the drive:
SCSI and IDE Considerations
There are differences in the formatting of the two types of drives. However, the PREP program takes care of almost everything. The PREP program only presents the options that apply to the drive type you have chosen. The IDE does not require a low level format. As a result , the PREP program does not present these options if you have chosen an IDE type of drive to format.

Step 1

Drive Selection Window

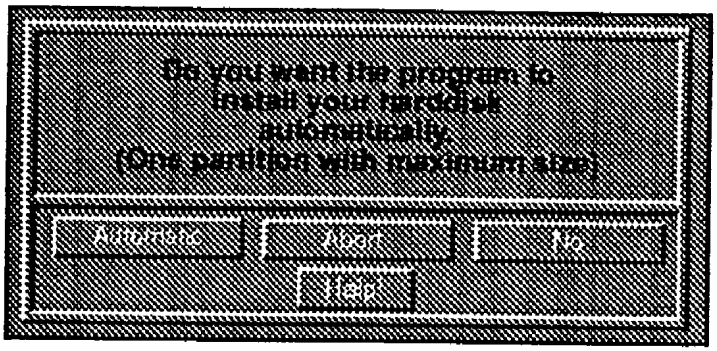
Action = Select Drive



BUTTON	FUNCTION
INSTALL	Select the "Install" button located to the right of the drive you wish to prep, modify or format.
ABORT	Clicking on the "Abort" button returns the software to Workbench.

Step 2

Automatic or Manual Installation Window



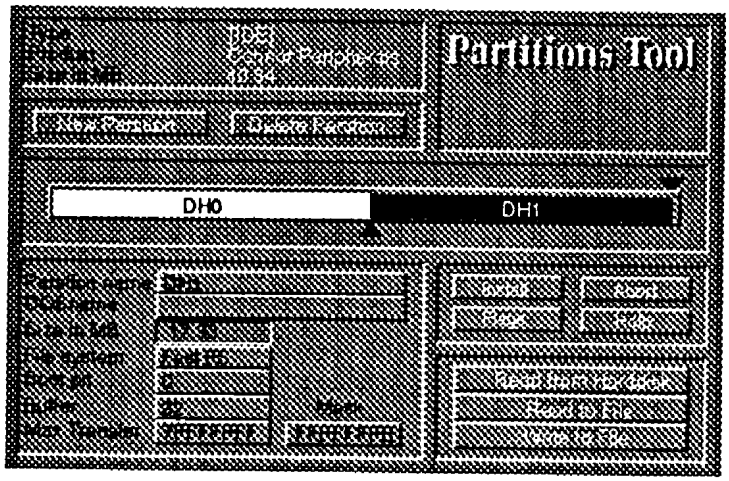
Action = Select Automatic or
Select Manual

BUTTON	FUNCTION
AUTOMATIC	Begins the automatic Installation procedure. Sets up and formats the drive with one partition of maximum size.
NO	Begins manual installation through the Partitions Tool Screen.
ABORT	Returns to drive selection screen

Step 3

Partitions Tool Screen

Action = Define partition and drive specifications.



BUTTON	FUNCTION
NEW PARTITION	Creates a new partition on the hard drive.
DELETE PARTITION	Removes the currently selected partition.
INSTALL	This button begins the actual install process.
ABORT	Returns to the Drive Selection Screen.
FLAGS	Opens the edit flags window.
HELP	Enables the on-line help window.

READ FROM HARDDISK	Resets the partition information to the last settings stored in the RigidDiskBlock.
READ FROM FILE	Reads the partition information from a saved file on floppy disk.
WRITE TO FILE	Stores the current partition information to a file on disk as a backup encase the information stored in the RigidDiskBlock becomes corrupt.

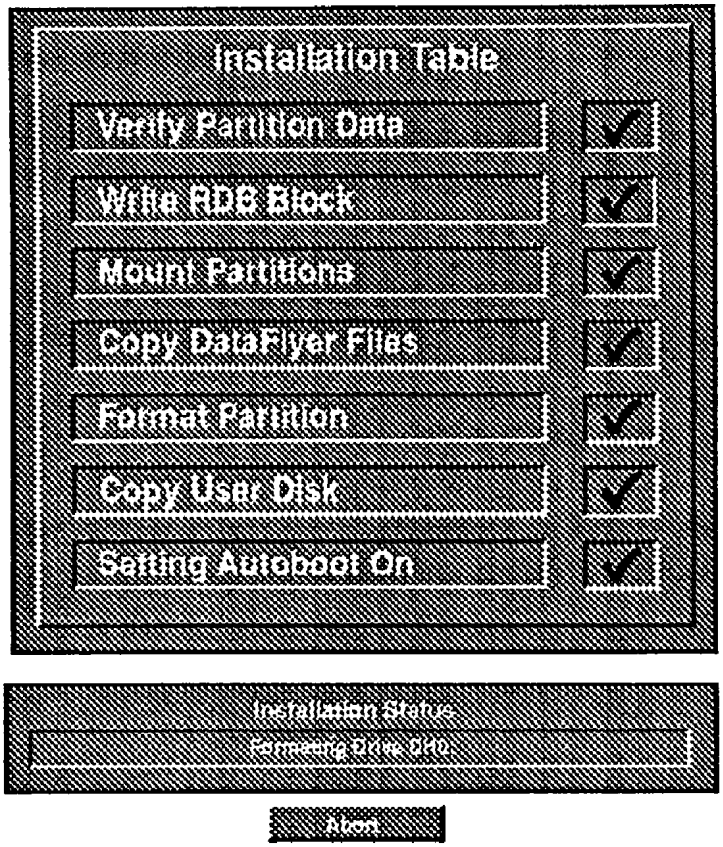
DATA FIELD	FUNCTION
PARTITION NAME	The physical unit name of the current partition i.e. DH0.
DOSNAME	The name of the partition as seen under it's icon on Workbench.
SIZE IN MB	The size of the currently selected partition. This value can only be changed by moving the partition size sliders.
FILESYSTEM	Toggles which file system to use when formatting a partition. DO NOT AmigaDOS format a partition set for an alternate or OldFileSystem!
BOOTPRI	This value helps to determine which partition to boot from. The partition with the highest boot priority value always boots first. The boot priority for the booting partition should be 1 and 0 for the other partitions. The floppy drive has a priority of 5. It is not advisable to make the harddrive partitions go higher than this number as the harddrive would always boot and a disk in DF0: would never boot.
BUFFERS	This value determines how much memory is reserved for buffering data transferred between the Amiga and the hard drive.
MAX TRANSFER	Sets the maximum amount of data transferred between the Amiga and the DataFlyer in one transfer. Usually, this value can be left alone.
MASK	Specifies the memory range in which the controller may safely work when transferring data. This avoids conflicts with other controllers that may require a certain memory region.

Step 4

Installation Table/Status

Action = None. These are for status information during the formatting process

Empty box = Pending
Coffee Cup = Processing
Check Mark = Completed

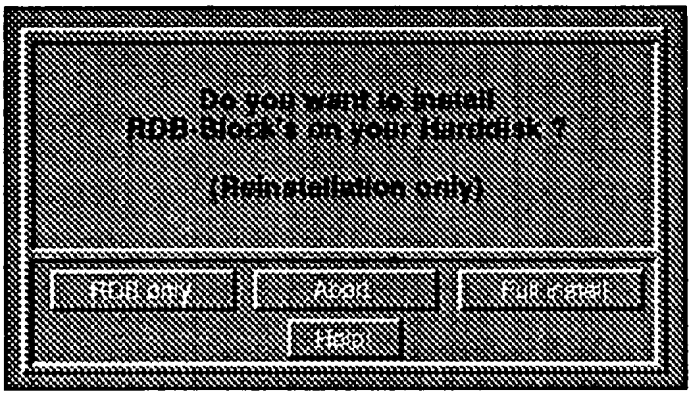


BUTTON	FUNCTION
ABORT	Will stop the format process.

Step 5

RDB Install Window

Action = Choose to update only the RDB information.



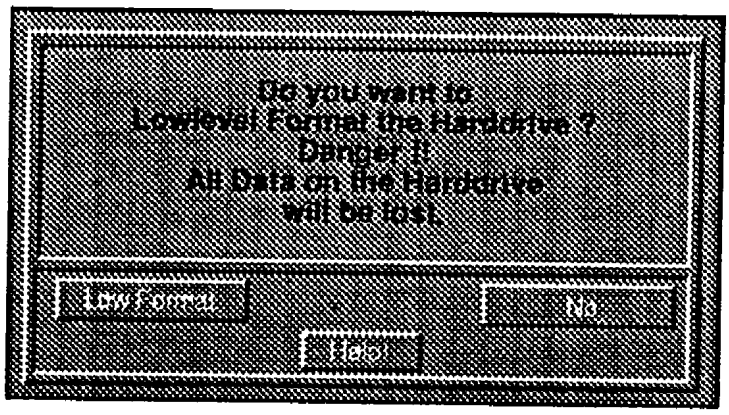
BUTTON	FUNCTION
RDB ONLY	Updates only the RigidDiskBlock on the hard drive. This allows the partition parameters to be updated without having to reformat the hard drive. The data on the hard drive will only remain intact if the low and high cylinders of the partitions have not been altered.

RDB Install Window continued.

ABORT	The Abort button will exit the format procedure and return to the Partitions Tool screen.
FULLINSTALL	The Fullinstall button completely installs and formats the hard drive. It is to be used if this is the first installation to the hard drive, or partitions have been added or removed.

Step 6

Low Level Format Requester



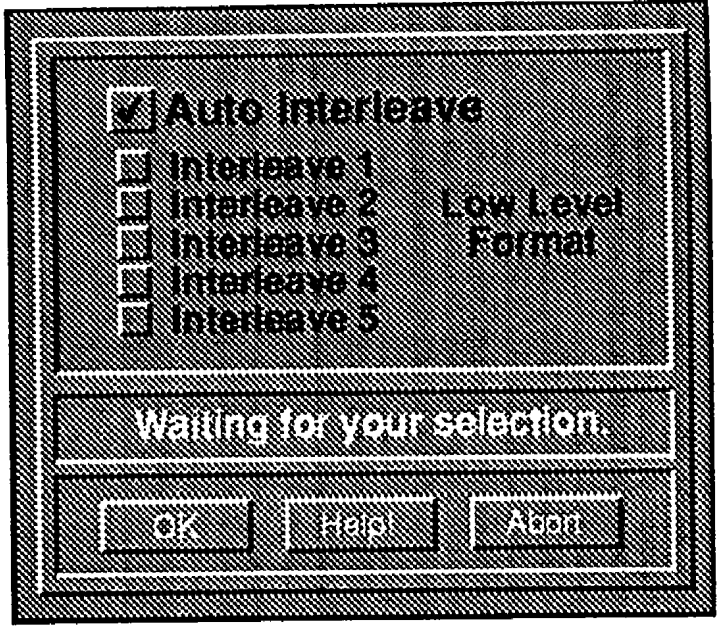
Action = Choose to low level format the drive.

BUTTON	FUNCTION
LOW FORMAT	Opens the Low Level Format window. A low level format is required to prepare the drive for an AmigaDOS format. Usually, the drive is pre-low level formatted at the factory, and this option should not be used often.
NO	Skips low level formatting the hard drive.

Step 7

Low Level Format Window

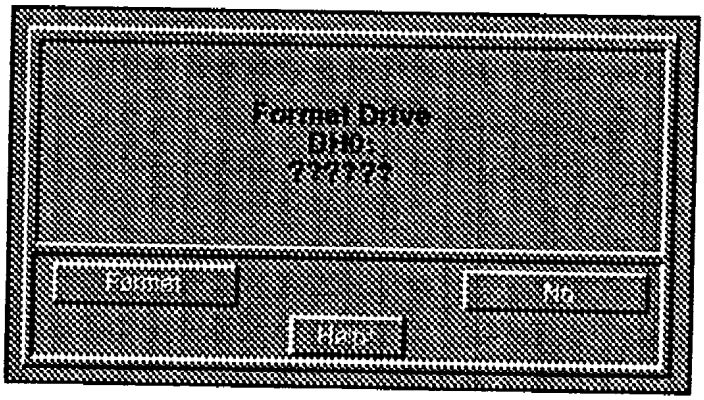
Action = Choose Interleave or test for best interleave.



BUTTON	FUNCTION
AUTO INTERLEAVE	Clicking in this box toggles the Auto Interleave tester. Most newer model drives use Interleave 1 as a standard, however, if you are uncertain of a drives interleave, select this function. Unselecting the test "unghosts" the radio buttons to manually select the interleave.
INTERLEAVE 1 - 5	These "radio buttons" are used to manually select the interleave value. They are only active if the Auto Interleave test is toggled off.
OK	Begins Low Level formatting the drive using the selected interleave, or the interleave determined by the Auto Interleave test.
ABORT	Exits the Low Level Format screen

Step 8

Format Drive Window

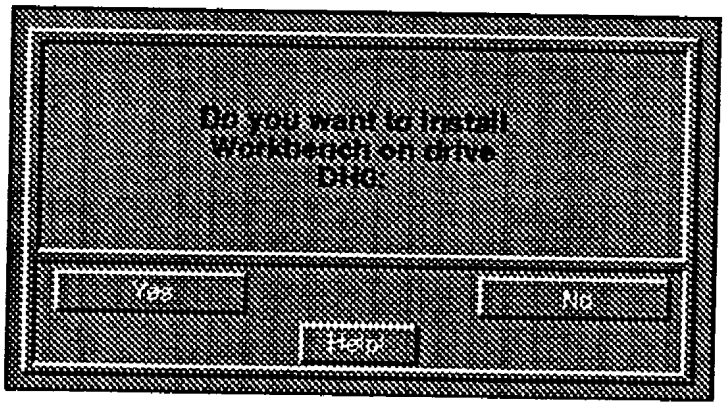


Action = Last chance to abort the format program.
DATA WILL BE LOST

BUTTON	FUNCTION
FORMAT	Performs an AmigaDOS format on the partition listed.
NO	Skips AmigaDOS formatting the listed partition

Step 9

Install Workbench Requester

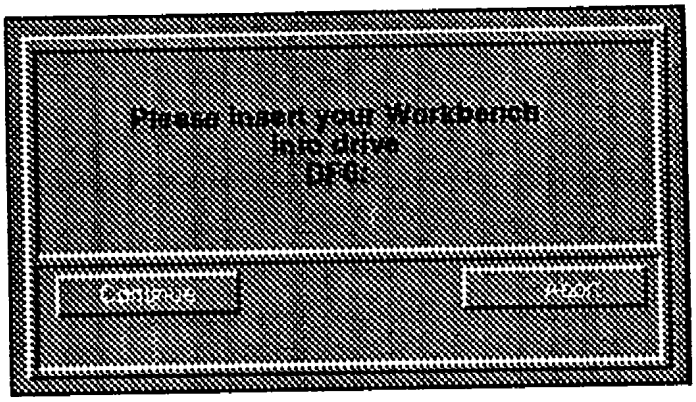


Action = Choose to install your Workbench disk.

BUTTON	FUNCTION
YES	This function copies a Workbench (or any other AmigaDOS format) disk to the listed partition. Click "Yes" before inserting the disk to be copied.
NO	Bypasses copying a disk to the listed partition.

Step 10

Disk Copy Window



Action = Copy Workbench files to hard drive

BUTTON	FUNCTION
CONTINUE	The "Continue" button begins copying all of the files on the disk in DF0: to the hard drive.
ABORT	Returns to the Disk Copy Requester

FORMATTING A SECOND OR THIRD DRIVE
If you have one AutoBooting drive and you are formatting a second or third drive then refer to the Customized Configurations section in this manual.

REFORMATTING AN AUTOBOOTING DRIVE
If you have an autobooting drive that needs to be reformatted certain steps must be taken. As soon as the power is turned on the drive will want to Autoboot and grab the system. If it is not a DOS disk then it can't boot and it will hang. To boot the system place the AutoInstall disk in DF0: and hold the LEFT mouse button down while turning on the power to the machine. The system will ignore the attempt by the drive to Autoboot. Then follow the instructions in this manual for formatting the drive.

TO REFORMAT A FORMATTED DRIVE:
1. INSERT AUTOINSTALL DISK IN DF0:
2. HOLD DOWN THE LEFT MOUSE BUTTON
3. TURN ON THE POWER TO THE COMPUTER
4. RELEASE BUTTON WHEN DF0: STARTS TO LOAD

TO REFORMAT A FORMATTED DRIVE

INSERT AUTOINSTALL DISK IN DRIVE DF0:

HOLD DOWN THE LEFT MOUSE BUTTON

AND TURN ON THE POWER TO THE COMPUTER.

RELEASE MOUSE BUTTON WHEN DRIVE DF0: STARTS TO LOAD

General Information on Hard Drives

Your hard disk drive may be accessed by your programs or by you just as the floppy drives are used. We suggest you try one or two partitions until you become familiar with your specific requirements.

Setting up and taking advantage of your new DataFlyer hard drive is greatly enhanced if you have a working knowledge of Shell or CLI in the AmigaDOS operating system.

Hard disk disadvantages are few, but important. The disk itself is fragile. Because of this most of the newer drives automatically park the heads when the power is turned off. This is done to protect the drive if it suffers a shock like being dropped onto a table. In such a case the read/write heads could touch the magnetic platters inside the drive and scratch the surface of the platters, making the disk unusable and requiring repair. You would lose all data stored on the disk if that were to happen.

Even with autoparking heads it is advisable to exercise caution when handling the drive. Also the storage medium is generally not removable like a floppy disk. However, if this is important there are drives that have removable media such as the Syquest. The DataFlyer is also compatible with these types of drives. Finally, the drive is physically larger and heavier than a floppy disk drive.

Dos and Don'ts of Using a Hard Drive

DO back up the data on your hard disk drive often. We recommend a commercial backup program like QuarterBack or our insurance program. There are few worst feelings than just realizing you have to reformat your drive and it isn't backed up. You may not believe it right now but this is the most important paragraph in this manual.

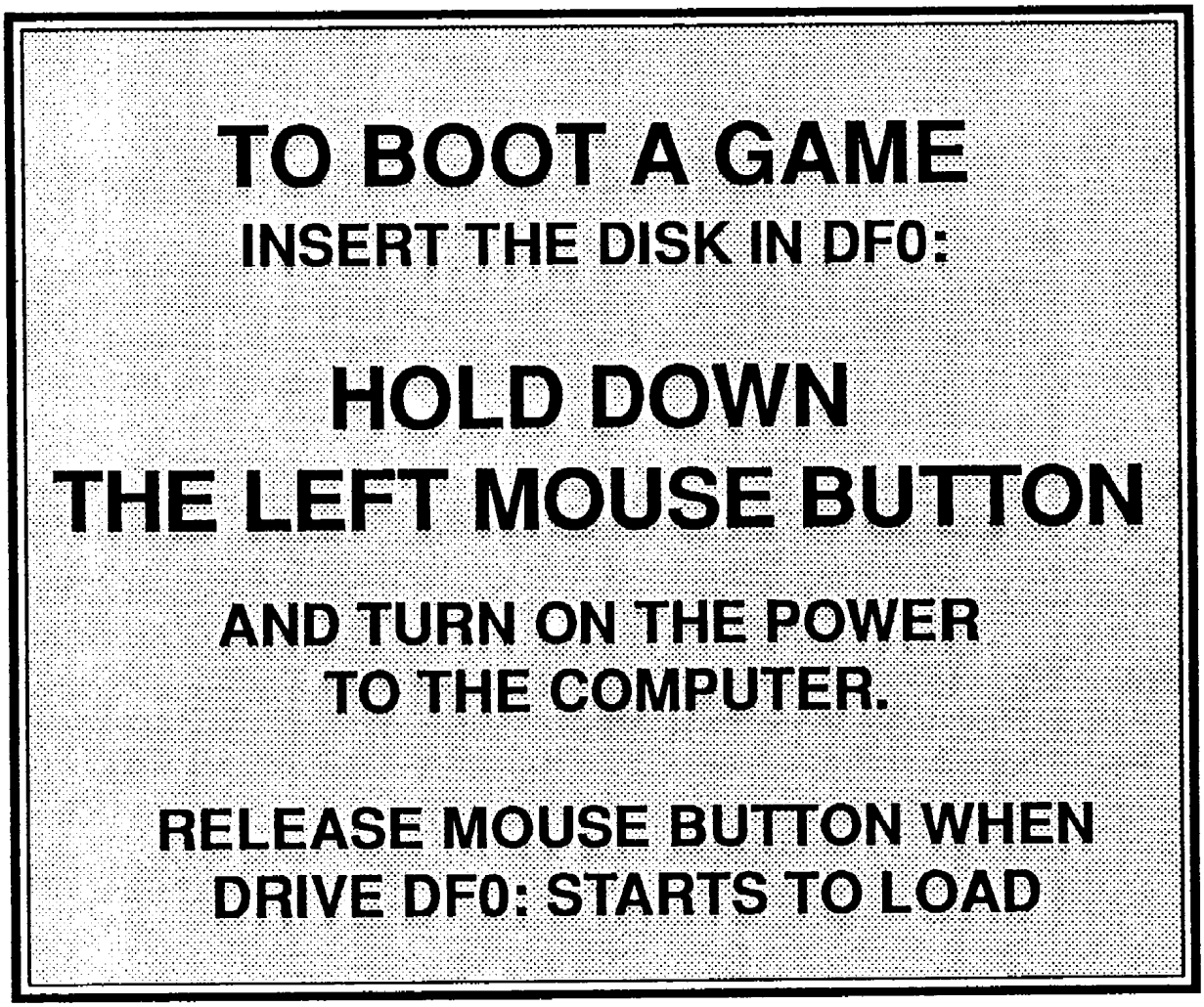
DO allow the hard disk to rebuild its internal file structure at power on. Occasionally, the software in the drive will detect confusion about free sectors and file chains. The drive light may flash for several minutes as the drive does its housekeeping. Let the drive continue...the pause is annoying, but necessary. Don't turn the power off or attempt to reboot your computer after accessing the hard disk drive for any reason. This is critical, ALL DATA COULD BE LOST if AmigaDOS has not completed updating necessary files on the hard disk. This may not be complete even though it appears that all activity is finished. Wait at least 25 seconds after the last command was given to the hard drive before turning off or rebooting.

Again, if this is not followed your your drive may need to be reformatted and your DATA COULD BE LOST. This is a very annoying problem with the multitasking AmigaDOS and not a result of the DataFlyer.

DON'T subject your hard disk to physical shocks...ever. A drop of one inch onto a table top can severely damage your hard disk. Great care should be taken to use the original shipper when shipping or transporting your drive.

Game Switch

To free up memory (RAM) used by the harddrive when working with floppy-based games or applications hold the left mouse button down and turn on the power to the machine. The system will ignore the hard drive.



Auto-Booting

The auto-booting function will work only with a Kickstart 1.3 or higher in the Amiga. You can determine the version of the Kickstart ROM by booting the computer without a disk in df0:. If it asks for Workbench 1.3 then the Kickstart version is 1.3 if it asks for Workbench 1.2 then your Kickstart is version 1.2. If you wish to defeat the auto-booting just hold down the left mouse button during the boot sequence. See Configuring the DataFlyer in this manual.

Installing Software on Your Hard Drive

Great care must be taken when transferring your software programs from their original floppy program disk to the hard drive. This is something that must be done exactly per the individual programs requirements. The good news is it only has to be done once. Because of this most software manufacturers will provide a hard drive installation program that takes care of their programs individual requirements. It is impossible, I am sure you will agree, for our customer service people to be familiar with all the software programs and their specific needs.

> QUESTIONS CONCERNING THE INSTALLATION OF SOFTWARE PROGRAMS ONTO THE HARD DRIVE ARE BEST ANSWERED BY THE MANUFACTURER OF THE SOFTWARE.

If your software does not include specific instructions or an installation program, some general guidelines may help.

Generally, simply moving the program icons to the hard drive window will not work. Most programs will have files (without icons) which are required for the program to run. Also, an ASSIGN statement will generally be required in the startup-sequence (located in the S directory to set the required volume name to the hard disk.

The CLI command COPY DF0: to DH0: ALL will transfer all the files but will move some files such as the startup-sequence which should not actually be changed on the hard disk. Further, the volume name must still be added to the startup-sequence to set the correct directory.

The above copy command may be used if a new directory is created on the hard disk, but it still puts all the files into one directory...even those which should be moved to other directories to make segments of the program work with other programs and peripherals. The volume name remains a problem.

The best way to install a program is to follow the instructions given by the program's author or manufacturer. But if the program has no instructions for use on a hard drive, the end user (you) must take the responsibility of examining the files on floppy disk, creating appropriate directories, and then copying the programs and files to the various directories. This may take some time.

Cleaning Up the Screen

If your hard disk drive starts with a large number of icons seemingly stacked one on top of the other in a too-small window, move icons with the following procedure:

First, use the left mouse button and increase the window size with the sizing gadget in the lower right corner of the window. Use the right mouse button, and select snapshot from the Special menu in the top line of the screen display.

Then, one at a time, drag the icons you wish to move to their new locations in the window. After moving each icon, select snapshot again. When you are satisfied, close the window and re-open it. Your icons will be placed where you left them.

An alternative method allows the operating system to determine which icons go where on the screen. Enlarge the window with the sizing gadget and then select cleanup from the Special menu. Hold a SHIFT key down, move the mouse pointer to each icon, and select the icon with the left mouse button. When all icons are selected, release the SHIFT key and select snapshot from the Special menu. In addition, WB 2.0 and above users can select "Cleanup" from the Workbench pull-down menus.

TROUBLESHOOTING

General Hints

Troubleshooting theory is based on 3 basic methods:

1. Isolating the problem.

Do one thing at a time. If it works, go onto the next. If it doesn't, the chances are the problem is isolated in the last step. Examine it carefully. Build on what you know works.

> CHANGE ONE THING AT A TIME. IF YOU CHANGE FIVE THINGS YOU HAVE FIVE PLACES TO LOOK FOR PROBLEMS.

How many elements are there? Test them individually. Substitute if possible. If your DataFlyer works on a similar A500 we can suppose it is your machine. If it doesn't work on a friends then it is isolated to the hard drive or modifications to the hard drive like the startup-sequence.

2. Backup Backup Backup Backup

If we are to build on what we know works we must be able to get back to what was last working. Before you change anything, can you recreate what you have working now? Do you have a copy or know the configuration of what was working. This is especially true in the early stages of learning how to use a hard drive. This is also true in using the floppy but with a hard drive it becomes very painful because of the amount of data at risk.

> BACKUP ANYTHING YOU PLAN TO CHANGE THAT MAY CAUSE TROUBLE. ESPECIALLY THE STARTUP-SEQUENCE

3. Document your search.

What have you tried? When there are combinations it becomes difficult to recall what worked and what didn't. This will also save time if there are several elements as you will not be trying the same things more than once. Keep these notes when calling customer service.

General Problems

Booting

If the screen is blank without even a Workbench request then you might have 1.2 version of Kickstart. Auto-boot will only work with version 1.3 and 2.0 of Kickstart. Remove the jumper designated "1.3" and follow the instructions in the format sequence for Kickstart 1.2 users.

You will need to use the boot disk made by the PREP program to manually boot the drive.

Hangs while booting.
Did you change your startup-sequence? If yes replace the changed file with the original that worked. Isolate what was changed and look at that command for anything that is incorrect.

Unusual LED or drive activity.
When you power up and the drive light blinks slowly or stays on and the system appears to be very slow in booting....DO NOT REBOOT. AmigaDOS may be validating the disk. This may take anywhere from 1 to 30 minutes depending on the size of the drive and the number of partitions. This can possibly be avoided in the future by waiting 15 seconds for all tasks to complete before turning off the system. Or you may be using a program that is corrupt. The system will soon sort itself out and be back to normal. This is an annoying aspect of AmigaDOS and not the DataFlyer software. Yes, this was mentioned earlier.

LED light stays on.
After determining that AmigaDOS is not trying to validate the disk it may mean that the polarity needs to be reversed on the wires going the LED. See the section Installing the Hardware in this manual.

System crashes copying large files.
If you crash while transferring very large files then you probably have run out of RAM memory. You will need to increase the stack size using the CLI STACK command. The systems default stack size is 4000. Increase this number to 8000 or 10000 or experiment to find the size that works best for you. From CLI type "Stack 8000" without the quotes and hit return. Increasing the Stack size uses more of your memory. See the Commodore Software Enhancer manual for more information.

DiskDoctor
If you get this message there are real problems. **TRY TO USE DISKDOCTOR AS A LAST RESORT.** Backup or copy all files that can be copied to another partition or to a floppy. After running DiskDoctor you will need to reformat you drive and all data will be lost. This usually means that one of the programs your are using is causing a major problem. What did you change last? Try to isolate to a specific program and stop using that program. This may take time.

A500 Formatting
If your drive is new and you receive an error code when the drive was being mounted, quickly turn the power off and on. This will reset the drive. The initial power surge required to spin up a totally new drive may have exceeded the amount available. Resetting the drive without it spinning all the way down will allow the drives internal tests to clear it to be formatted. This should not occur after the initial attempt. Also be sure your drive is at room temperature before trying to format the unit.

Optimizing your drive.
Backup-Backup-Backup the information on your drive before optimizing. This is an unstable operation at best. If you are using Quarterback be sure you have the latest revision. There have been as many as 18.

Software problems
The most common problem with a new hard drive is the incorrect installation of the owners programs. With few exceptions the hard drive does not discriminate between programs. Build on what we know works. If the drive formatted correctly and the Workbench that was copied to the first partition opens and operates correctly then the chances are great we have a working drive. If it did not go through the formatting sequence see Hardware Problems in this section.

From this base add one program at a time. Test each and be convinced that it is operating properly through boot and read/write tests. Then go onto the next program. If the system reads and writes correctly with one program and does not with another then the chances are great the problem is isolated to the non functioning program.

> IF A PROBLEM CAN BE ISOLATED TO THE LAST PROGRAM ADDED CALL THE AUTHOR OR MANUFACTURER OF THAT PROGRAM FOR HARD DRIVE INSTALLATION INSTRUCTIONS.

If you feel that the drive is not operating correctly with the standard Workbench program that is installed with the prep program then call your dealer or customer service.

Hardware Problems
Before doing anything else check all connections and cables. On the A500 be sure the interface is securely connected to the Amiga bus. The chassis can be against the computer case and still have missed the connection that is inside and out of sight. Check the connectors to be sure they are clean and make a solid connection. On the A2000 check to see if the interface is seated all the way into the 100 pin expansion slot. Is the ribbon cable connected per the instructions?

Remove all peripherals that are connected to the machine and add them back one at a time. Test each individually as it is added onto the computer.

Try your DataFlyer drive on another computer. If it works, look for what is different with your computer or it may be defective. The bus can be defective and the rest of the computer can operate correctly.

Amaxll Driver

Using DF-Prep, simply change the partition name of the partition you wish to convert into AMAX. Leave the FileSystem set for FastFileSystem. Amax will automatically switch it to "Alternate". Click the install button, and chose "RDB-Only" to update the name on the hard drive.

Floptical Drives

On power-up, floptical drives are set for read-only mode. The "Floptical" utility on the install disk is used to enable writing to the floptical drive. You must run the Floptical program before formatting the floptical diskette. See "Floptical" in Appendix A for more information. Floptical disks are usually pre-low-level formatted with a 1 : 1 interleave ratio. If you require low-level formatting the floptical diskette, be sure to select "Interleave 1". Note that it takes approximately 45 minutes to low-level format a floptical disk, and the Auto-Interleave test may take as long as four hours!

Attaching Multiple Drives

IDE

Attach the second IDE drive to the ribbon cable. A longer cable might be required. Set the drive to either MASTER or SLAVE depending on its use. It must have its own power supply if it is being attached to an Amiga 500.

SCSI

There are two ways to attach a SCSI drive. Attach it to the ribbon cable like the IDE or use the DB25 SCSI pass through that mounts on the rear panel of the DataFlyer. To the DB25 attach a standard Mac DB25 to Centronics cable to an external chassis with its own power supply. Make sure the drives have a different SCSI address.

Formatting a Second or Third Drive

Formatting a second drive works exactly like formatting a single drive. Be sure to choose the second drive in the "Drive Selection Window". Be sure the DOS names are different in the Partitions Tool window.

Manually Booting the Drive.

If you have Kickstart 1.2 the PREP program can create a disk that will be able to manually boot your drive from the AutoInstall disk that is in DF0:. Located in the drives RigidDiskBlock is the information pertaining to your drive. To manually mount your drive do the following:

1. Place the boot disk or AutoInstall disk in DF0:
2. Hold down the left mouse button and turn on the power to the computer.
3. Open up the Workbench window and from Shell type:

DFMount <unit #> [Return]

The unit # is 0-6 for SCSI and 80 or 81 for IDE. See DFMount in Appendix A for more information.

You can now access your hard drive. Because we used another startup-sequence to boot the drive not all the assigns etc. will have been completed that would have been done with the startup-sequence that was on the hard drive.

Manually Formatting the Drive

Creating a Boot Disk.
If you use the boot disk created by the PREP program it will contain all the information needed to format your drive. If not you will have to create one. Copy the AutoInstall disk files onto a standard Workbench. See the listed files in the Utilities section. Be sure that the file DFMount is in the C directory. Modify the startup-sequence to DFMount all drives. See Appendix A for more information.

AmigaDOS or High Level Formatting Drive.
From Shell type the following instructions Then remove the disk in df0: and reboot the system.

```
DFMount <unit #>                                    [return]
format drive <partition name>: name "mydrive" quick [return]
```

Surviving a Crashed Partition
If you have 3 partitions and only want to re-format one of them, do the following:
1. Autoboot the machine as you would normally.
2. From shell type the following instructions to high level format the partition:

```
format drive dh2: name "mydrive" quick  [return]
```

In the above if you have two partitions and you are only formatting the second then use "dh1:" instead of "dh2" etc. A low level format should not be required.

How To Modify The Startup-Sequence
The only way to modify the startup-sequence is carefully. The startup-sequence is located in the S directory. The startup-sequence is a Workbench 1.3 file that the computer follows when booting the system. Workbench 2.0 uses a file called User -Startup. This file can be edited by the user to customize the system. FAIR WARNING-changes made to the startup-sequence can effect how you boot or if you will boot. ALWAYS have a backup copy of the current working startup-sequence file. If you make a change that causes your system to not boot through to the Workbench screen then reboot and hold "ctrl D" to break the sequence. Edit out the last change and try to determine what went wrong. If that does not work the old file that was changed must be replaced by the working file. See the section Trouble Shooting in this manual. There are many editing programs. One on the Workbench disk is "ED". To edit the startup-sequence on the hard drive type the following from shell:

```
CD DH0:                 [Return]
ed s/startup-sequence   [Return]
```

If a blank screen appears and it states "creating a new file" then check the spelling of startup-sequence. If all is OK then the screen will have some activity and then go to a print out of the file. Using the up and down arrows and delete key make the modifications. To exit this window there are two options. One is exit and save the changes and the other is to exit and not save the changes. To SAVE type the following keys while in the edit window:

ESC
x [Return]

To NOT SAVE the changes and exit the window type the following from the edit window:

ESC
Q [Return]

Both will get you back to the Workbench screen.

Using Removable Media

Removable Media

The typical hard drive uses media that consists of fixed metal platters housed in a casing with multiple warnings like "Do not open under penalty of death" fixed all over. On the other hand a removable media drive is exactly that. The media or the information can be removed and placed on another drive. This is done via a cartridge or floppy disk. Another great advantage to these types of drives is when the media is full - get another one and start all over. You have a drive of unlimited size. These types of drives have been around quite awhile. One of the more popular and most known is the Syquest drive. It uses a conventional spinning metal disk with a read write head all contained in a plastic removable cartridge. It comes in 40Mb and 80Mb sizes. A newer entry into the market is from Insite. It uses and optical reader and the media is a special floppy that contains 20Mb of information.

The DataFlyer has been designed to be compatible with both of these types of drives. Each needs some simple setup to run and each is explained below.

Syquest Drives

When using a Syquest drive or any drive using media that can be removed the system must know when the media has been changed. This is taken care of in floppy drives by the familiar diskchange click we hear. In the Syquest drive you must run a simple program called CheckDC from the startup-sequence. This lets the system know that you have removed and reinserted another disk. This program is found in the C directory.

After naming the program you must designate the device by designating the partition name of the drive. Below we are assuming that the Syquest drive was named EH0:.

Type the following in your startup-sequence before LoadWB:

Run C:Check EH0:

The Syquest drive is a SCSI device and each removable cartridge must be treated just like a SCSI hard drive. It must be formatted using the PREP program. Each cartridge can be partitioned like a hard drive. If the Syquest is the only drive then each Syquest must be formatted as an Autoboot cartridge or designate one cartridge as the one you will always boot from.

Floptical Drives

Users wishing to use this type of drive must run a special program in the startup-sequence that allows the DataFlyer to read and write to the drive. This program is found in the C directory. After naming the program you must designate the device name of the floptical drive.

The automatic diskchange feature must also be run when using a floptical and this too is placed in the startup-sequence. This program is called CheckDC and is also found in the C directory and must have the device designated. The startup-sequence entry below assumes that the floptical is using the partition name EH0:.

Type the following in your startup-sequence before LoadWB:

C:FLOPTICAL EH0: (or C:FLOPTICAL -<SCSI unit #>)
Run C:CheckDC EH0:

The floptical drives are SCSI devices and each "floptical diskette" must be treated just like a SCSI hard drive. It must be formatted using the PREP program. Each diskette can be partitioned like a hard drive. If the floptical is the only drive then each diskette must be formatted as an Autoboot diskette or designate one diskette as the one you will always boot from.

TO FORMAT A FLOPTICAL BOOT THE MACHINE AND FIRST TYPE FLOPTICAL FROM SHELL THEN RUN THE PREP PROGRAM

SCSI Direct

Auto-Install version 2.0 or higher supports SCSI direct which allows devices such as CD ROMs and tape back-up systems to be connected to the DataFlyer.

Interleave Tester

The Tester can be found as part of the Prep program and is run only from there. Interleave is a ratio that determines how information is taken off the drive. This can vary from drive to drive. The proper ratio matched to your drive will give the best performance. To determine the proper interleave for your drive the Tester will format the drive with each ratio and run a speed test. The fastest will be chosen and your drive will automatically be formatted with that interleave. The interleave ratio chosen will be displayed in the Status formatting window. This does take time and the length varies on the drive that is being tested.

DataFlyer Auto-Install Files

The following files are found on the Auto-Install disk:

DIRECTORY	FILE NAME	DIRECTORY	FILE NAME
C	CheckDC	DEVS	ExpSys.amhd*
	Defdisk		ExpSys.device*
	Figdump		HardDisk.Driver*
	Floptical		IDEdf.Handler*
	Inquire		SCSIdf.Handler*
	DFMount		
	SetAutoBoot*	ROOT	DFPrep*
			DFPrep.info*
			HelpText.TXT*
L	Autoboot.code*		

The files with an * are those required to format and run the hard drive. They are to be included on any manual boot disk. Below is a brief description of the critical files.

FILENAME	DIRECTORY	DESCRIPTION
ExpSys.device	DEVS:	Main DataFlyer device driver
HardDisk.driver	DEVS:	General HardDisk control functions.
IDEdf.handler	DEVS:	IDE control functions
SCSIdf.handler	DEVS:	SCSI control functions
ExpSys.amhd	DEVS:	DataFlyer AMAX II driver (SCSI only)
Autoboot.code	L:	Processes the RDB when booting

Updated Software Notes

PLEASE NOTE: If the hard drive was previously formatted with an older version of the DataFlyer install software, note that there are several major changes in this version. The result of which, is that the older install program is not compatible with this version. To use the features of the new prep program, do the following:

- Make a backup of the hard disk
- Boot the computer using the left mouse button to disable autobooting. This step is very important when reformatting the hard drive.
- Install the hard disk with the new prep program.
- Restore the backup data to the hard disk.

There are many changes in the new Prep program which mainly concern the data safety on the hard disk. It's better, if possible, to reinstall the hard disk with this new software. Here's why: The older versions of the DataFlyer software stored the boot up and driver files along with everything else on the hard drive. This opened up possibilities that the files could get overwritten or deleted, causing all the information on the hard drive to be lost. Using this new software, all the necessary files are "locked" and hidden away in a reserved partition, where they cannot be easily removed, deleted or formatted over. This reduces the chance of accidently losing the data on the hard drive by 95% and now also makes the drive "Optimization safe". Also, this new software allows some of the information on the drive to be modified without having to reformat the entire drive.

IDE

Below are listed the pin assignments for the 40 pin connector on the rear of the drive. Pin number 20 is cut off for prevention of incorrect connector insertion.

IDE Pin Numbers

Signal	Pin Num.	Signal	Pin Num.
-RESET	01	RSVD	21
GND	02	Ground	22
+DATA 7	03	-IOW	23
+DATA 8	04	Ground	24
+DATA 6	05	-IOR	25
+DATA 9	06	Ground	26
+DATA 5	07	+IOCHRDY	27
+DATA 10	08	+ALE	28
+DATA 4	09	RSVD	29
+DATA 11	10	Ground	30
+DATA 3	11	+IRQ14	31
+DATA 12	12	-IOCS16	32
+DATA 2	13	+ADR1	33
+DATA 13	14	-PDIAG	34
+DATA 1	15	+ADR0	35
+DATA 14	16	+ADR2	36
+DATA 0	17	-CS0	37
+DATA 15	18	-CS1	38
Ground	19	-SLV/-ACT	39
KEY	20	Ground	40

SCSI

Below are the pin assignments of the 50 pin SCSI connector located at the rear of the drive. All odd pins except pin 25 are connected to ground. Pin 25 is not connected.

SCSI Pin Numbers

Signal	Pin Num.	Signal	Pin Num.
-DF(0)	2	Ground	28
-DB(1)	4	Ground	30
-DF(2)	6	-ATN	32
-DB(3)	8	Ground	34
-DF(4)	10	-BSY	36
-DB(5)	12	-ACK	38
-DF(6)	14	-RST	40
-DB(7)	16	-MSG	42
-DB(P)	18	-SEL	44
Ground	20	-C/D	46
Ground	22	-REQ	48
Ground	24	-I/O	50
Terminator Power	26		

)B25 SCSI Pass Through Connector

elow are the pin outs for the connector used to attach external SCSI devices to the CSI bus.

SCSI DB25 Pin Numbers

Signal	Pin Num.	Signal	Pin Num.
REQ	1	Ground	14
MSG	2	C/D	15
I/O)	3	Ground	16
RST)	4	ATN	17
ACK	5	Ground	18
BSY	6	SEL	19
Ground	7	PARITY	20
DATA0	8	DATA1	21
Ground	9	DATA2	22
DATA3	10	DATA3	23
DATA5	11	Ground	24
DATA6	12	TERM Power	25
DATA7	13		

Registration and Warranty

Please send in your registration card immediately. This must be on file for warranty work to be done.

The Expansion Systems warranty does not cover the hard drive you place in the chassis or mount onto the interface unless purchased directly from Expansion Systems. Please read carefully the warranty located on the back cover of this manual.

Return Policy

Before returning any merchandise you must have a warranty card on file and a Return Authorization Number. This number is obtained from an Expansion Systems customer service representative. Package your product very carefully using the original packaging materials. This is especially important if you are sending a hard disk mechanism. Insure the entire contents for the retail price. Packages without an RA# on the outside of the box will be refused.

If you purchased the DataFlyer interface and/or chassis and purchased the hard disk mechanism from another source you may have to deal with more than one company to get your problem solved. If you agree to have us look at both your interface and the third party hard disk - it is at your own risk. As indicated the hard disk is a sensitive piece of equipment. We cannot be responsible for the condition of the drive when it arrives if it is not packaged properly.

Customer service

The best place to obtain answers to your questions and service is from the dealer where you purchased the product. If you need customer service directly from the manufacturer call 510 656-2890 between 8:00 to 11:30 AM and 12:30 to 5:00 PM Monday through Friday Pacific Standard time. Please have your notes documenting what you have tried and what you have isolated. It is best to fill out the Product Information section of the worksheet on page 36 before calling as our customer service technicians may require this information. This form may also be FAXed to Expansion Systems at (510)656-5131 and would require the Customer Information section also completed. Also it is best if you are at your computer with it turned on. If you have to call back on a continuing problem try to help the customer service representative by updating them with where you are and what has been done. This will save you time. Your satisfaction with our products is very important to us and every attempt will be made to get you running. However, keep in mind that our responsibility and technical ability lies with making sure your drive boots and reads and writes information correctly. We cannot be familiar with the specific needs of each software program.

Customer Service Form

Customer Information

Name: _____

Address: _____

City: _____ State _____ ZIP: _____

Phone _____ Work _____

Product Information

Product _____ SCSI __ IDE __ COMBO __

Board Revision: _____

Autoboot ROM Rev: _____

AutoInstall Version: _____

Amiga Model: _____

Pass or Fail:

DF-Prep:	P	F
Inquire :	P	F
Figdump:	P	F

KickStart Version: _____ Workbench Version: _____

Amiga CPU: _____ Hard Drive(s): _____

Describe in detail the general symptoms and the conditions under which they occur:
Please list any other expansion boards connected to the Amiga:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX - A

UTILITIES

Located on the AutoInstall disk are several utilities for trouble shooting and working with the hard drive. These commands must be run from Shell or CLI, and can be put in the Startup-Sequence if necessary.

FigDump

Format : FIGDUMP
Path : C:FIGDUMP
Purpose : Figdump is a diagnostic utility to see if the controller is being accessed on the bus. A list of parameters built into the controller's ROM will be dumped to the screen. This GENERALLY indicates the card is functioning. If there is nothing displayed after typing the command, then the interface is not installed properly on the bus or the card is not functioning properly.

Inquire

Format : INQUIRE
Path : C:INQUIRE
Purpose : Inquire polls the SCSI and IDE bus to search for drives. It will report back the status of every SCSI and IDE unit number. If Inquire cannot locate a drive on the bus, check the cable. Also, check to see that the drive is functioning by trying it in another computer or on another interface.

DefDisk

Format : DEFDISK <drive>
Path : C:DEFDISK
Purpose : This small program simply assigns all the system directories (including C, System, L, Devs, S, Fonts and libs) to a specified drive.
Example : DEFDISK DH0:

DFMount

Format : DFMOUNT <unit> <unit> <unit>
Path : C:DFMOUNT
Purpose : This program mounts all partitions on a hard drive which are not capable of autobooting and automounting (i.e. 1.2 Kickstart machines, or hard drives not formatted using the DataFlyer controller.)
Example : DFMOUNT 3

Floptical

Format : Floptical <unit>
Path : C:FLOPTICAL
Purpose : Floptical enables writing to the floptical diskette. It must be run before formatting the floptical diskette, and be placed in the startup-sequence to it is run upon booting.

CheckDC

Format : Run CheckDC<DOSName>
Path : C:CHECKDC
Purpose : Checks for a disk change on removable media drives. It should be placed in the startup-sequence. The AmigaDOS DiskChange command must also be in the C directory.
Example : Run CheckDC DH0:

APPENDIX - B

HDToolBox

NOTE: Please note that some functions under HDToolBox may not work correctly. Please use extreme caution when using this program.

To use HDToolBox with the DataFlyer, a tool type must be added through the Information screen on Workbench. The tool type should read:

SCSIDEVICENAME=ExpSys.device

Optionally, it can be run through command line by entering the following at a CLI or Shell prompt.

HDToolBox ExpSys.device

Please note that the above examples are case sensitive and must be entered exactly as shown! For more information on creating tool types, see the AmigaDOS manual.

NOTICES

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LIMITED WARRANTY

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